AEROSPACE
RESEARCH APPLICATIONS CENTER

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Quarterly Report

Period Ending June 30, 1967

NASA Contract SC-NASr-162

By

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SUMMARY OF OPERATIONS

This quarter was highlighted by the successful renewal of the major portion of participating industrial firms under the revised fee schedule announced November 1, 1966. The number of company memberships which fell due for renewal during this quarter was greater than in the other three quarters of the year combined. The results achieved on renewals were quite encouraging in that all companies renewed.

This indicates that the market test initiated with the announcement of the revised fee schedule has produced a promising base of information which suggests that ARAC is moving forward toward a self sufficient position for the operations portion of the Center's activities.

Revenue projections from company operations for 1967 indicate an order of magnitude of $110,000 to $115,000.

It was apparent at the close of the quarter that the revised fee schedule did not cause member firms to discontinue use of the Center's services. In contrast, however, these companies were not willing to pay proportionately more for service levels consistent with those utilized during the past twelve months. Rather, the bulk of participating firms chose to adjust downward their service needs to remain at a fee level consistent with that paid last year. While there are some indications that service useage by these firms may increase in the future, the apparent influence of a historical budget level seems to prevail.

Although an adjustment was anticipated, the impact of renewals during the quarter suggests that the revised fee schedule will not be adequate to cover full operations' costs primarily because of the proportionately large base of fixed costs necessary to the Center's operations in providing effective services. This is currently under study. It is quite possible that further fee schedule adjustments will be necessary later in the year.

Operations for the quarter are discussed on the following pages. The specific areas included are the results to date of the market test; a summary of efforts directed toward expanding the user base; organization and manpower; new technology transfer mechanisms; and activity highlights.

MARKET TEST

Only seven firms remained to be renewed under the revised fee schedule at the end of the quarter. All firms which came up for renewal during the quarter continued their memberships in the Center for another year. While the overall results were quite encouraging there are a number of implications which seem apparent at this point with the bulk of member firms successfully renewed.

Perhaps the most important of these implications is the apparent impact of the revised fee schedule on the various service components

provided to participating firms. Review and analysis of findings to date suggest the following:

The relatively high cost of selective dissemination interest profiles coupled with the availability of standard interest profiles apparently caused a large number of custom profiles to be eliminated (for example one company with 33 custom profiles discontinued the entire group and substituted 48 standard interest profiles).

The modular type fee schedule tended to focus attention in the companies on each service element which resulted in the discontinuation of certain apparently unnecessary elements (for example one company with 37 Industrial Applications Report mailings renewed 18).

Significant changes in the mix of the Center's products appear to be influencing the fixed cost portion of the various service elements.

While there is no substantive data to draw from, there is a strong indication that the prices in the revised fee schedule are inelastic over a fairly wide range (in other words, a firm would purchase the same number of retrospective searches at $125.00 each as it would at $70 each).

The Center's service activity mix adjustment to the revised fee schedule has had a significant impact on level and types of manning requirements.

EXPANDING THE USER BASE

Experience during the quarter tended to reinforce the expectation indicated in the last quarterly report that the revised fee schedule would tend to encourage a proportionately larger number of firms to join the Center. The following six new members were added during the quarter:

Abbott Laboratories, North Chicago, Illinois
Borg-Warner Corporation, Des Plaines, Illinois
Coats and Clark, Incorporated, Union, New Jersey
Franklin Electric Company, Incorporated, Bluffton, Indiana
Sinclair Research Incorporated, Harvey, Illinois
Wheel-Horse Products, Incorporated, South Bend, Indiana

Three additional companies have established an intent to join the Center. One of these is a previously served division of a member company which was not included when the parent company renewed its membership last quarter.

Feedback from negotiations with companies suggests that certain firms may want to purchase services on an "as required" basis without entering

into a formal membership arrangement. This alternative is presently being analyzed. It may be possible to work out a modified fee schedule for this purpose thus providing two alternative ways of meeting industry requirements. The Center continues to explore better and more flexible ways to meet the needs and requirements of the industrial community.

Efforts are under way to expand the operations segment of the Center's activities to other user groups. A pilot program is currently being implemented with the State of Georgia under the State Technical Services Act. Similar arrangements are under development with the State of Ohio.

A major event in the promotional activity of the quarter was the workshop held for member and prospective member company representatives held on April 26-27. The day was designed to work in depth with a medium-sized group in two phases. The first phase was an afternoon devoted to discussing the ARAC information transfer system. The second phase involved individual sessions with company people and members of the ARAC staff centered on how their needs and interests might be coupled with ARAC service elements. The list of attendees to the Conference is shown in Appendix A. The two day discussions were quite useful. Three of the firms have joined (one has indicated an intent to join) the Center's group of member firms.

A vigorous effort is underway to develop more functional packaging for service outputs to customers. For example, an inexpensive three-ring binder has been designed for retaining the 26 mailings in a standard interest profile throughout the year. Cover sheets have been printed for each mailing with an identification of the service output. Packaging is important to the effective marketing of a product or service. Feedback from participating member firms has indicated that this improved packaging design has been very favorably regarded by recipients.

Additional promotional efforts include 57 letters written to prospective company members. A list of visitors to the Center (excluding prospective and current member firms) is shown in Appendix B along with external promotional efforts by various ARAC staff members.

ORGANIZATION AND MANPOWER

Effective June 1, 1967, Dr. Joseph DiSalvo, formerly Assistant Director for Special Projects, was made Director of ARAC. Mr. Charles W. Mullis, formerly Assistant Director of Operations, was promoted to Associate Director for Operations. Mr. Richard W. Counts, formerly Manager of Information Systems, was promoted to Associate Director for Information Systems.

Dr. Howard L. Timms, formerly Director of ARAC, returned full time to his activities as Professor of Production Management, Graduate School of Business. He will continue an advisory association with ARAC as Chairman

of the Policy Planning Committee. Dr. Ralph Cleland, formerly Co-director, is now Chairman of the Science Coordinating Committee.

Dr. David W. Cravens, formerly Director of Operations, will join the faculty of the University of Tennessee in September. He will continue to serve the Center in an advisory capacity as Consultant to the Chairman of ARAC.

In an effort to involve member companies more in the policy guidance of the Center, the Advisory Board has been enlarged to include one representative from each member company. Response to this by member companies has been very enthusiastic and a broad range of talents is represented by those nominated to the Advisory Board by the various member firms. It appears quite evident that this policy change will have a significant impact on the future of the Center by bringing it even closer to the industrial community.

Determining the long term mix of manpower both in number and types of skills presents a difficult problem. The activity adjustment resulting from the revised fee schedule has necessitated certain changes in manning. The fixed (or overhead) manning requirements are relatively insensitive to activity level. For example the requirement for an adequate computer systems group exists whether or not activity levels are double the present (or half the present for that matter).

Manning is one of the Center's most important tasks. The nature of the work involved makes it extremely difficult to increase or decrease manning over a short time span. The planning horizon for these decisions ranges from 18 to 24 months into the future. This, coupled with the fact that the Center's most important resources are people, make decisions in this area among the most important--and the most difficult.

The Center's manpower plan is being reviewed and will require certain revisions. Inputs to this analysis include activity projections, present and future contract requirements, and emerging market opportunities. This area continues to receive the close attention of the Center's Management group.

NEW TECHNOLOGY TRANSFER MECHANISMS

Since its inception the Center has continued to develop promising technology transfer mechanisms. One of the most promising transfer systems appears to be the Standard Interest Profile. Initial efforts for this service element began during the later part of 1966. An expanded development effort is included in Contract NSR 15-003-055.

The market test to date for the SIP's has been quite encouraging. Subscriptions to the Standard Interest Profiles have grown from 17 at the end of the fourth quarter 1966 to 217 at the end of this quarter. The mix of profiles in various scientific and technical areas is shown in Appendix C.

ACTIVITY HIGHLIGHTS

Activity levels for services to fee-paying organizations are tabulated in Appendix D. The following comments are by services as numbered in Appendix D.

(1) Retrospective search requests declined further this quarter. This is attributed to the fact that each search must now be paid for on a unit fee basis.

(2) Subscriptions to Custom Interest Profiles (CIP) remained essentially constant suggesting that the impact of the revised fee schedule is now fully absorbed.

(3) Subscriptions to Standard Interest Profiles (SIP) doubled. It is interesting to note that the sum of CIP and SIP subscriptions now totals about 100 more recipients than the number of CIP recipients last year. This indicates approximately a 33 per cent increase in total Selective Dissemination Service output.

(4) The decrease in document requests is partially due to the decrease in retrospective searches. There is some indication that the increased number of interest profiles (combined CIP and SIP) may generate additional document requests as the Standard Interest Profiles gain momentum.

(5) Although the number of Tech Briefs announced was down, requests for supplementary information were up. This is due to a campaign to remind the recipients that supplementary information is available through the Center.

The number of Industrial Applications reports announced remained the same but the number of mailing point recipients declined. This activity is also influenced by the fact that these reports are no longer provided free of charge.

(6) The Marketing Information Service activity average for the first two quarters continues at a level equal to last year's average. This service seems to have been relatively unaffected by the fee schedule changes.

(7) The Computer Information Service decline is attributed to the fact that programs are no longer available free of charge.

Since the majority of our members have now been renewed under the current fee schedule, it is felt that the activity figures shown in Appendix D are indicative of the stabilized activity levels which will emerge. However, this cannot be assured until next quarter's data are in.

APPENDICES

A. Workshop Participants

B. Visitations and Promotional Effort

C. Mix of Standard Interest Profiles

D. Activity Summary

APPENDIX A

ARAC WORKSHOP PARTICIPANTS

April 26, 1967

MEMBER COMPANIES

BALL BROTHERS RESEARCH CORPORATION
Mr. John J. Graham

CUMMINS ENGINE COMPANY
Mr. N. A. Weil

ESTERLINE ANGUS INSTRUMENT CO., INC.
Mr. J. C. Habacker

OWENS-ILLINOIS
Mr. Sul Hi Lee

PUBLIC SERVICE INDIANA
Mr. Gerald S. Dailey

PULLMAN-STANDARD
Mr. M. G. Marshall

WHEEL-HORSE PRODUCTS, INC.
Mr. R. F. Hawkins

URBAN ORGANIZATIONS

EVANSVILLE-VANDERBURGH METRO.
PLANNING COMMISSION
Mr. W. D. Jones

PROSPECTIVE MEMBER COMPANIES

ASHLAND OIL & REFINING COMPANY
Mr. Harold Hicks

BORG-WARNER CORPORATION
R. C. Ingersoll Research Center
Mr. M. B. Millenson

E. I. DUPONT DE NEMOURS & COMPANY
Mr. R. M. Cavanaugh

FRANKLIN ELECTRIC COMPANY
Mr. A. L. Streater
Mr. J. R. Turk

GENERAL DYNAMICS/CONVAIR
Mr. Hugo F. Mohrlock

HOTPOINT DIVISION - GE
Mr. George Vanderwerp

MILES LABORATORIES, INC.
Dr. Dean F. Gamble

OTIS ELEVATOR COMPANY
Mr. William F. Drummond
Mr. Arthur J. Olsen

UNIROYAL, INCORPORATED
Mr. J. L. Foster
Dr. H. D. Glenn
Mr. L. J. Primeau

APPENDIX B

VISITATIONS AND PROMOTIONAL EFFORT

Visitors to ARAC

Production Equipment Agency, Rock Island	Miss Beverly Geske	April 12, 1967
Social Sciences Research Council - London, England	Dr. A. B. Cherns	April 28, 1967
Knowledge Availability Systems Center, University of Pittsburgh	Mr. Ed Howie	May 22, 1967
Midwest Research Institute, Kansas City, Missouri	Messrs. L. Rosine, B. Rhodes, G. Ford, W. Gall, and E. Fago	June 21-22, 1967
NASA - Washington, D. C.	Dr. K. Lesner, Mayor Simms, & Col. Atwell	June 22-23, 1967
British Ministry of Technology - London, England	Mr. Cyril Giles, Head Information Division	June 26, 1967

Promotional Efforts

April:

- Trial Memberships to forty companies (90 days) - JD/Staff
- American Marketing Association, Akron, Ohio - HLT
- Instrument Society of America, Florida - JD/CWM
- Technology Transfer Seminar at Northwestern University, Evanston, Illinois - HLT
- Indiana Business Education Association in Indianapolis, Indiana - AMW
- National Science Foundation and National Engineering Foundation Conference in Washington, D. C. - AMW
- American Chemical Society Meeting, Florida - JD

May:

- Talk at IEEE Meeting in Chicago (Appliance Manufacturers Technical Group - 300 People) - DWC
- Clinic on Automation in Libraries - University of Illinois - RWC
- Meeting with Chemical Abstract Services representatives in Columbus, Ohio - JD/RWC
- Conference on European Technology Gap, sponsored by NATO, in Deauville, France - HLT
- Management Science Meeting at Boston University - HLT
- Technology Utilization Conference at Lewis Research Center in Cleveland, Ohio - JD/RWC

June:

- Talk to thirty Indiana Executive Program participants on ARAC Management Science and Marketing Services - DWC
- Orientation meeting with Oregon State University Representative for State Technical Services Act - DWC

APPENDIX C

MIX OF STANDARD INTEREST PROFILES

Technical Area	Number
Inorganic Fiber Technology	2
Crystal Growth	2
Carbon and Graphite	1
Physical Metallurgy	5
Powder Metallurgy	5
High Temperature Applications of Metals	4
Materials Joining Technology	12
Material Forming and Machining	10
Structural Analysis and Mechanical Properties of Materials	15
Non-Destructive Testing	11
Corrosion and Protective Coatings	9
Bearings and Lubricants	8
Fluid Flow	2
Hydrocarbon Fuels and Combustion	2
Air and Water Pollution, and Industrial Safety	7
Methods of Chemical Analysis	6
Reinforced Plastics	5
Polymer Chemistry, Physics and Testing	6
Temperature Measurement	4
Plasma Engineering	0
Laser Developments	8
Laser Research	3
Cryogenics and Superconductivity	1
Logic Circuits	5
Infrared Technology	4
Photography	1
Display Systems	11
Telemetry	6
Recording Systems	9
Semiconductor Devices and Microcircuit Fabrication	18
Microwave Systems	5
Radio Antennas, Transmission and Propagation	6
Radio Communications Equipment	8
Computer Programs	10
Abnormal Environment Phsiology	0
Biotechnology	2
Nuclear Biology	1
Turbine Technology	3
Total	217

APPENDIX D

ACTIVITY SUMMARY

Type of Service	1966 Quarterly Average	First Quarter 1967	Second Quarter 1967
(1) Retrospective Searches	193	83	66
(2) Subscriptions to SDS Custom Interest Profiles	296	178	173
(3) Subscriptions to SDS Standard Interest Profiles	N/A	111	217
(4) Document Requests from (1), (2), and (3)	3,896	3,888	2,849
(5) Industrial Applications Service			
(a) Tech Briefs Disseminated	136	145	113
Requests for Supplementary Information	26	33	64
(b) ARAC Industrial Applications Reports			
Abstracts Announced	104	104	104
Requests for Full Copy	2,483	2,137	1,560
(6) Technical Marketing Information Service			
Requests for Documents	574	860	484
(7) Computer Information Service			
(a) Requests for Documents	48	94	24
(b) Copies of Programs	139	175	60
(8) Extrapolated Annual Rate of Document Requests (all sources)	30,948	28,748	20,164